

REMARKS

I. Introduction

The undersigned thanks Examiner Yang for the review and consideration of the present Application. In response to the non-final Office Action mailed December 2, 2011 (“Action”), the undersigned submits the present remarks (“Response”). Claims 1-20 are pending in the application, with claims 17-20 having been withdrawn by the examiner as non-elected claims. No new matter has been added by the Response. The Response is believed to overcome all of the prior Office Action rejections, and allowance of the pending claims is respectfully requested.

II. Rejections under 35 U.S.C. § 103

The Action rejected claims 1-10 and 12-16 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,551,950 to Badyal et al. (“Badyal”) in view of U.S. Patent No. 4,827,870 to Lee (“Lee”). The Action rejected claim 11 under 35 U.S.C. § 103(a) as being unpatentable over Badyal in view of Lee and further in view of U.S. Patent No. 6,663,713 to Robles et al. (“Robles”).

Assignee respectfully traverses these rejections and requests reconsideration in light of the following remarks, withdrawal of the rejections, and allowance of all pending claims.

A. Badyal

Badyal teaches a method of coating a surface with a polymer layer, which method comprises exposing the surface to a plasma comprising a monomeric unsaturated organic compound comprising a chain of carbon atoms and optionally substituted by halogen; provided that where the compound is a perhalogenated alkene, it has a chain of at least 5

carbon atoms, in a volume of 470 cm^3 so as to form an oil and water repellent coating on the surface. Badyal, Abstract, Example 1.

B. Lee

Lee discloses an apparatus and methods for applying high performance multilayer optical interference coatings to polymeric substances of complex curved topography. Lee, col. 1, ll. 43-45. These polymeric substances are coated by plasma enhanced chemical vapor deposition (“PECVD”). *Id.*, col. 1, ll. 47-48. The starting reactant has the form M-R, where M is a metal and R is an organic component. *Id.*, col. 1, ll. 57-60.

C. Independent Claim 1

Independent claim 1 recites *inter alia* the following features:

- a plasma deposition chamber in which a plasma zone has a volume of at least 0.5 m^3 ; and
- applying a voltage as a pulsed field, at a power of from 0.001 to 500 W/m^3 .

D. Response to the Rejections

The cited references cannot establish a *prima facie* case of obviousness because they do not teach or suggest the claimed method and are not properly combinable under 35 U.S.C. § 103.

The Action asserts that Badyal teaches a process for depositing a polymeric material onto a substrate comprising introducing a monomeric material in a gaseous state into a plasma depositing chamber, igniting a glow discharge, and applying an average pulsed power of about 0.04 W with 20 μs pulsed time on and 20,000 μs pulsed time off, while

acknowledging that Badyal does not teach the claimed plasma zone with a volume of at least 0.5 m^3 . Action, pages 2-3.

The Action then cites Lee as teaching a plasma enhanced chemical vapor deposition process within a chamber comprising an organic component and a $0.5\text{-}1.0 \text{ m}^3$ plasma reaction zone under vacuum conditions. *Id.*, page 3. The Action further states that it would have been obvious to apply the plasma zone taught by Lee to the Badyal process because both teach plasma processes for organic material deposition, and Lee teaches that excitation of the plasma allows chemical and physical thin film forming at low temperature conditions. *Id.*, pages 3-4.

Assignee respectfully asserts that the combination of Badyal and Lee does not render obvious the subject matter of claim 1 for at least the following reasons. *First*, it would not have been obvious that the method taught by Badyal could be scaled-up to reach the method recited in claim 1. Badyal teaches that the reaction is carried out in a small laboratory scale apparatus of 470 cm^3 in volume. Badyal, col. 5, ll. 23-27. The accepted view in the relevant art at the time of the invention was that the low power levels taught by Badyal could not be used in combination with a much larger volume, such as the volume required in a manufacturing scale unit (i.e., a volume of at least 0.5 m^3). In general terms, one would expect that considerably higher levels of power would be required to compensate for the substantial increase volume from laboratory scale to manufacturing scale. Support for this understanding may be found in the documents located through the International Search Report in international application no. PCT/GB2005/001017 (“‘017 application”), of which

the Application is a national phase application thereof, in particular WO03/090939 to NKT Research & Innovation (“NKT”).

Specifically, NKT describes a method for depositing a polymeric material onto a substrate by introducing a monomeric material in a gaseous state into a plasma deposition chamber, igniting a glow discharge within the chamber, and applying a voltage as a pulsed field for a sufficient period of time to allow a polymeric layer to form on the substrate surface, wherein powers of 2200 – 3200 W/m³ are required for plasma deposition when a vessel of 0.3 m³ is used. NKT, p. 21, ll. 5-16; p. 31, l. 14; p. 34, ll. 21, 30; claims 1, 17, and 26 (emphasis added). In the International Preliminary Report on Patentability issued in the ‘017 application, it was acknowledged that “the prior art leads the skilled reader away” from the use of the recited power levels in combination with the recited volume. According to M.P.E.P. § 2145(X)(D)(3), “the totality of the prior art must be considered, and proceeding contrary to accepted wisdom in the art is evidence of nonobviousness.” As a result, one of ordinary skill in the relevant art would not be motivated to combine the recited low power ranges with a manufacturing scale version of the method taught by Badyal because the prior art affirmatively teaches away from such a method. Thus, the only way that one of ordinary skill in the relevant art would reach the decision to use the recited power conditions with the recited volume is through improper use of hindsight using the claims as a template.

Second, Assignee respectfully asserts that it would not have been obvious to combine the plasma zone taught by Lee with the Badyal process because Lee is not a polymerization reaction. Rather, Lee teaches deposition of optical interference coatings, which are made up of organo-metallic compounds, onto polymeric substrates. Lee, col. 1, ll. 43-60. Even

though there may be an organic constituent in the starting materials, the process being effected is principally an inorganic one, with the primary intention of either oxidizing or reducing the metal content to produce the desired coating. *Id.*, col. 4, ll. 35-39 (“Deposition materials are then introduced into reaction zone 44 along with . . . appropriate reactive agents (for example, oxidizers O₂ or N₂O, or reducing agents like H₂”). Thus, the amount of energy required to carry-out inorganic reactions would be quite different from the amount of energy required to drive the formation of covalent bonds found in polymers of the type formed in the Badyal process. Furthermore, Lee’s process involves an entirely different apparatus, wherein the substance to be deposited is fed through one of the electrodes directly onto the substance being coated. *Id.*, col. 4, ll. 11-17. As a result, a person of ordinary skill in the art, after reading Lee, would not be motivated to combine the teachings of Lee with the process taught by Badyal when seeking to scale-up the polymerization procedures of Badyal.

Because the cited references do not teach or suggest the claimed compounds and are not properly combinable under 35 U.S.C. § 103, they fail to render obvious the subject matter of independent claim 1. Claim 1 is therefore allowable. As dependent claims 2-16 depend directly or indirectly from claim 1, they are allowable at least based upon their dependency from allowable base claim 1. Accordingly, Assignee respectfully requests allowance of pending claims 1-16.

CONCLUSION

The above remarks completely respond to the Office Action and place the application in condition for allowance, which action is respectfully requested. **EXCEPT** for the issue fees payable under 37 C.F.R. § 1.18, the Director is authorized by this paper to charge any

additional fees during the entire pendency of this application, including fees due under 37 C.F.R. §§ 1.16 and 1.17 that may be required, including any required extension of time fees, or credit any overpayment to Deposit Account Number 20-1430. This paragraph is intended to be a **CONSTRUCTIVE PETITION FOR EXTENSION OF TIME** in accordance with 37 C.F.R. § 1.136(a)(3).

If there are any matters that can be addressed by telephone, the Examiner is respectfully urged to contact the undersigned attorney at (404) 815-6608.

Respectfully submitted,

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